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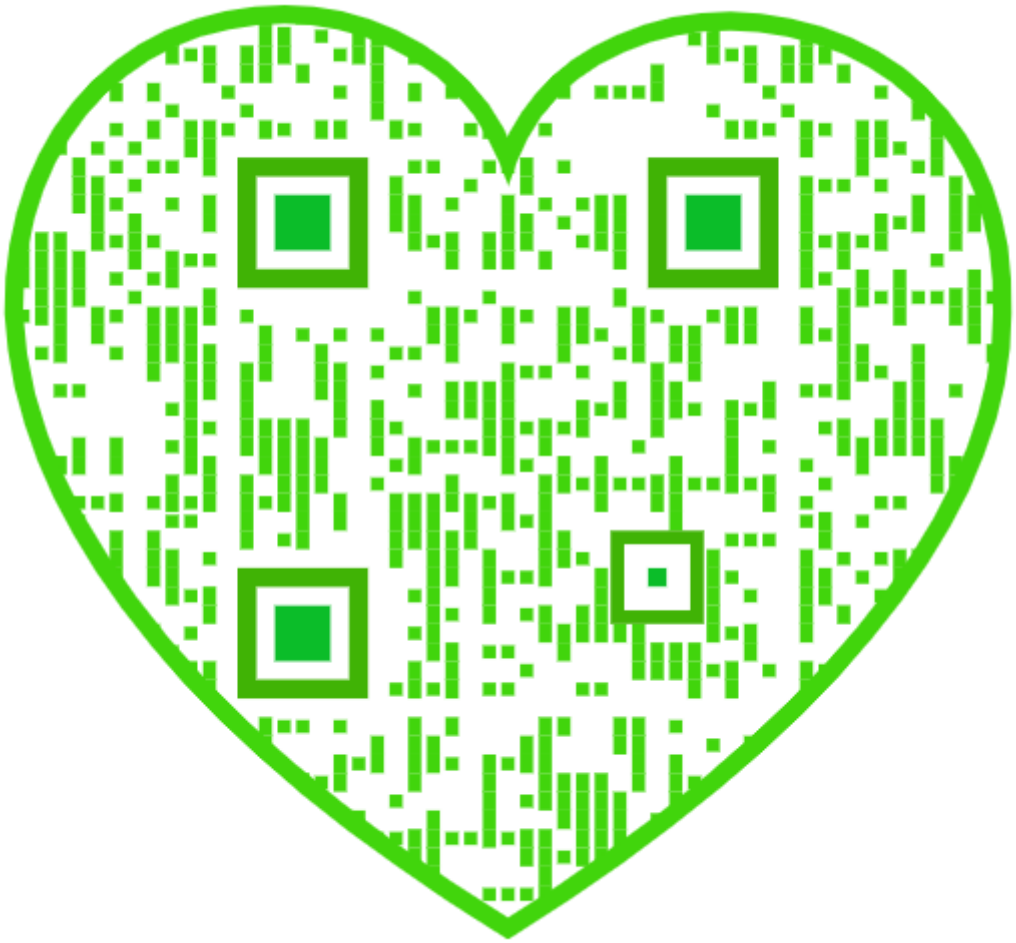

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A

HISTORY OF BELLS,

AND

Description of their Manufacture,

AS PRACTISED AT THE

BELL FOUNDRY,

WHITECHAPEL.

REPRINTED FROM "CASSELL'S MAGAZINE OF ART"

REVISED UP TO PRESENT DATE.

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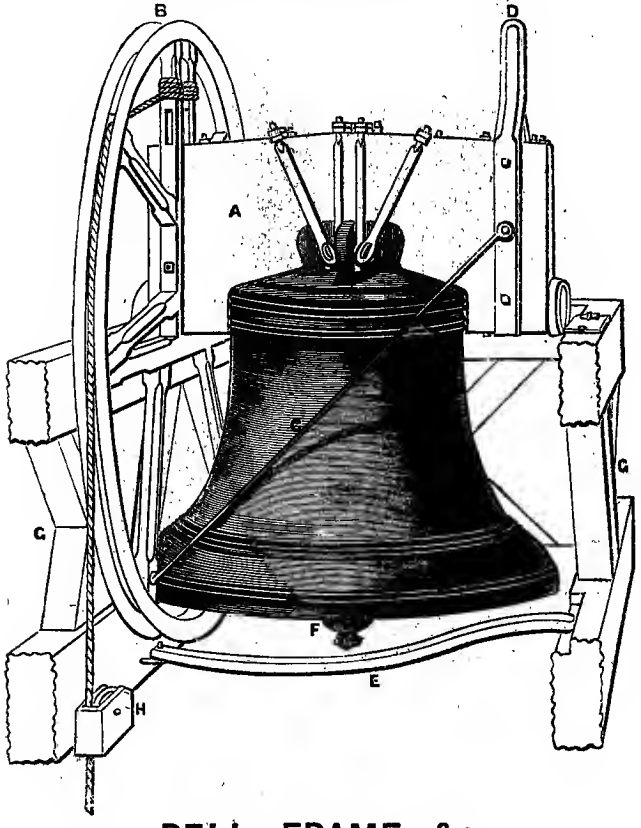
MEARS & STAINBANK,

Prize Medallists at the Great Exhibition, and at Dublin, 1865.



BELL, FRAME, &c.

A *Stock.* B *Wheel.* C *Wheel Brace.* D *Stay.* E *Slider.* F *Clapper.*
G *Frame.* H *Roller.*

Musical Hand-Bells in Sets from One to Seven-and-a-half Octaves.

A HISTORY OF BELLS,

AND DESCRIPTION OF THEIR MANUFACTURE.

It may be as well to state at once, that for much of what follows we are indebted to an amusing and well-written little book, by the Rev. Alfred Gatty, Vicar of Ecclesfield, entitled "The Bell; its Origin, History, and Uses." The author of this work has, with much patient ingenuity, traced the history of

> "The crazy old church clock
> And the bewildering chimes,"

and shown in what numerous ways the bell is mixed up with our social life.

The music of bells is of a very venerable and old-fashioned character, and from the earliest ages of the world has been used in various religious and other ceremonials. It is a matter of doubt when bells were first introduced, but it is unquestionable that they are very ancient. Their origin must be sought for in the records of Egypt, the mother of nations. Recent discoveries have made it apparent that the bell was known to the inhabitants of Assyria, Etruria, and China; and Thompson, in his "Etymons of English Words," says, under the article "Bells," that long before they were known in Europe they were in use in Hindoo temples to frighten away evil spirits. Be this as it may, we have certain record that bells—that is, small hand and ornamental bells—were in use among the Israelites. In the writings of Moses we have mention of the "bells of gold" with which the dress of the high priest was adorned —"a golden bell and a pomegranate upon the hem of the robe round about;" that when Aaron disappeared from the sight of the worshippers within the veil of the temple, the ringing of the bells upon his robe might be an intimation to them that he was still living in

the Divine presence. Again, in Zechariah xiv. 20, there is mention of bells as forming part of the harness or decoration of horses; and it is suggested by Mr. Gatty that even Tubal Cain, the sixth in descent from Adam, "an instructor of every artificer in brass and iron," might have scooped the sounding metal into some species of bells.

These small bells were, it appears, attached to the garments of Hebrew women, virgins, and boys, as well as to the pontifical robes. It seems, indeed, that small toy-like bells have been used in the service of religion from the earliest times; and prefixed to an old MS. edition of the Psalms of David, believed to be of the fourteenth century, is an illuminated representation of the "sweet singer of Israel," sitting before a small wooden frame, playing upon a row of bells with little hammers. This representation must, however, be considered rather as an illustration of the illuminator's own time, than as any authority for believing that hand-bells such as those represented were ever in use among the Hebrews.

The Greeks and Romans probably derived their knowledge of bells from the Egyptians, the first colonisers of Europe. The royal costumes of the shahs of Persia were also decorated with golden bells; and there is reason to believe that, in the decoration of mules and horses, as well as on the garments of the nobility of various nations, small bells were used long before the Christian era.

But not only in religious ceremonies was the bell anciently employed. Æschylus and Euripides inform us that the Greek warriors had small bells concealed within the hollows of their shields; and that when the captains went their rounds at the camp at night, each soldier was required to ring his bell, in order to show that he was awake and watchful at his post.

Bells were both Bacchic and mystic, as may be seen by reference to the ancient marbles in the British Museum; and it was from their use in the celebration of the mysteries that Plutarch endeavoured to show that the Jews worshipped Bacchus. In the triumphal entries of conquerors bells have also played important parts. They were hung as emblems and ornaments on the car of the warrior—as on that which conveyed the body of Alexander from Babylon to Egypt, as described by Diodorus Siculus; they were in use in the islands of the Archipelago to announce the opening of the markets, even as now; they were employed, as we learn from Plutarch, to detect and

prevent the escape of the unhappy Xanthians. When the city of Xanthus was besieged, some of the inhabitants tried to escape by swimming and diving through the river; but nets, with small bells attached, were spread across the stream under the water, and by the ringing of the bells each capture was announced.

In later times we find that the garments of the chief men and civil officers among the Germans were decorated with bells. They came, too, in time, to be regarded as the messengers of sorrow as well as of joy and triumph. The criminal had a bell suspended from his neck as he was led away to execution, and its sound announced his speedy death as he walked sadly in his own funeral procession.

The period when large bells first began to be used in churches is uncertain, but by the seventh century they were in pretty general use. At the end of that century the Venerable Bede mentions their existence in English churches. Their introduction has been variously assigned to Paulinus, Bishop of Nola, a town of Campania, in Italy, in the year of our Lord 400; to Pope Sabinianus (A.D. 604), to whom the honour of introducing bells into churches is given; and to various other persons.

Bells have been known under the various names of *Tintinnabulum*, a little bell so called from its tinkling sound; *Petasus*, a larger-sized bell, so named from its resemblance in shape to a broad-brimmed hat—by this latter instrument it was that the Greeks opened their fish-market, and the Romans invited the public to the bath; the *Codon*, from the Greek term, signifying the open mouth of the trumpet; *Nola*, a bell of similar size to the last, and named after the town of its inventor; *Squila*, a little bell used by the Italians; *Dodonæi lebetes*, the cauldrons of Dodona; and *Campana*, the true turret-bell, so called from the town of its birth—whence Campanolo, a bell-tower. It is probable that all, except the last, were made of forged metal, and were struck on the outside by a wooden or iron hammer, and that they all, more or less, resembled flat dish-like discs. Indeed, the very word Bell is said to come from the Latin *pelvis*, a basin or foot-bath; and if this be so, the configuration of ancient bells is at once determined.

In the history of the church of the Middle Ages the bell had much to do. First, it was christened with all ceremony; then it was employed in the various services of the day, convoking congregations, excommunicating the disobedient and the infidel, and, finally, being

FIG. 1.—THE FOUNDRY.

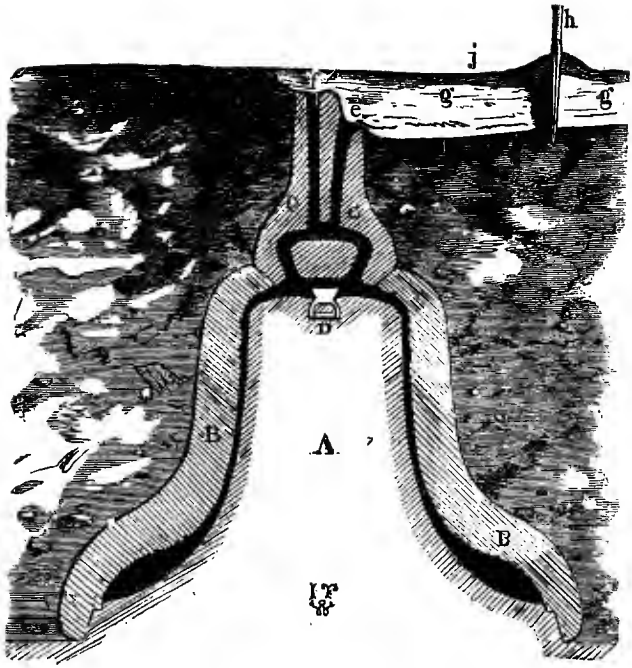


FIG. 2.—SECTION OF A LARGE BELL, WITH THE MOULD AND COPE, AS IT LIES IN THE PIT.

A is the inner mould, or core; B is the outer mould, or cope; C is the crown, or head, which is made independently of the other moulds, and is fitted on accurately just before the pouring in of the fused metal represented by *f*, which is running from the furnace in a glowing mass, *g g*; *e* is the hole left for the escape of the air between the two moulds; *h* shows the method employed in stopping off the supply of fused metal, so that the stream may be directed into a new channel; *j j* shows the earth surrounding the bell and mould; D is the staple to which the clapper is afterwards to be hung, and which is affixed when the mould of the bell is completed, the configuration of which is shown by the black line between the inner and outer moulds.

tolled at the moment when the spirit passed from out the earthly body. The ceremony of Christian baptism was certainly one of the most curious observances connected with the bell's history. The fused metal was blessed by the priests; and then, when the bell was turned out perfect from the mould, it was regularly passed through the ceremonies of baptism. Its sponsors were persons of rank, and the most considerable priest, or even a bishop or archbishop, officiated, with all the accompaniments of naming, anointing, sprinkling, robing, &c.

Excommunication by "bell, book, and candle," was long practised. The bell was rung to summon the congregation to this ceremony; the priest read the service from a balcony; and when the anathema was pronounced, the candles were put out, as an emblem of an extinction of hope in the sinner's soul.

The Complin Bell it was which summoned the people to the last religious service of the day. The Sanctus Bell was formerly hung in a small turret, outside the church, as may still be seen in some of our old churches; it is now merely a small hand-bell, which is rung during the service of the mass, to call the attention of the congregation to its more solemn parts. The Passing Bell was so named because it used to be tolled as the spirit passed out of the body.

"Prayers ascend
To heaven in troops at a good man's passing bell,"

says Donne, in allusion to the fact that at the sound of the passing bell all who heard it were enjoined to pray for the soul of the dying. From this custom is derived that of tolling the church bell at a funeral.

Everybody has heard of the *Couvre feu*, or Curfew Bell, which was introduced into this country from France by William the Conqueror. At eight o'clock in the evening it rang out its evening peal, and at the last stroke of the hammer on the metal all lights and fires were ordered to be put out. We will now enter

THE FOUNDRY,

and describe the modern process of bell-casting. For illustration, we will take the establishment of Messrs. Mears and Stainbank, Whitechapel, the oldest, largest, and best known of the kind in London or England. Before we describe the process of casting a

bell, it will be as well to inform the reader that bell-metal consists of an amalgam of copper and tin in the proportion of about three parts of copper to one of tin. Mention has been made of the old custom of adding a few gold or silver coins to the metal when in a state of fusion, but it is quite a popular error to suppose that the metal of old bells is of greater value from such a circumstance. The actual value of bell-metal, when formed into bells, is about £7 to £8 a cwt., including the cost of production; and when old bells are received in exchange, it is usual for the founder to allow about £5 to £6 per cwt. for the metal. There are, of course, various trade secrets as to the exact proportions of the different metals necessary to constitute a first-rate amalgam.

There is no great mystery in the bell-founder's art; but extreme care is necessary, in order to produce a good-toned bell, that all the preliminary operations should be conducted with the greatest exactness. With the aid of our artist, then, we will endeavour to explain the *modus operandi* observed in founding or casting a bell.

Passing through various yards, in which are stored quantities of old timber, old bell-metal, and a multitude of odds and ends, in the shape of old cannons and great masses of old copper, destined one day for the furnace, we arrive at the

MOULDING-ROOM.

Here a sight presents itself which is at once peculiar and striking All along the floor are ranged the moulds of future bells. In describing the casting of a bell, it will be necessary to observe, that it is nothing more than a layer of metal which has been run into the space between the mould and its outer covering, and allowed to cool. A glance at Fig. 2 will explain this very readily. Here we have a section of a bell as it lies in the pit during the process of casting. If the reader keep this diagram in his mind's eye, he will have no difficulty in comprehending all that we may have to say on the subject. The various parts of a bell may be described as the body or barrel; the clapper or striker, hanging in the inside; and the ear or cannon on its top or crown, by which it is hung in its chosen position in the tower. The following description, therefore, applies to all bells, large and small, the various modifications in the shape, &c., not interfering with the principle on which it is manufactured.

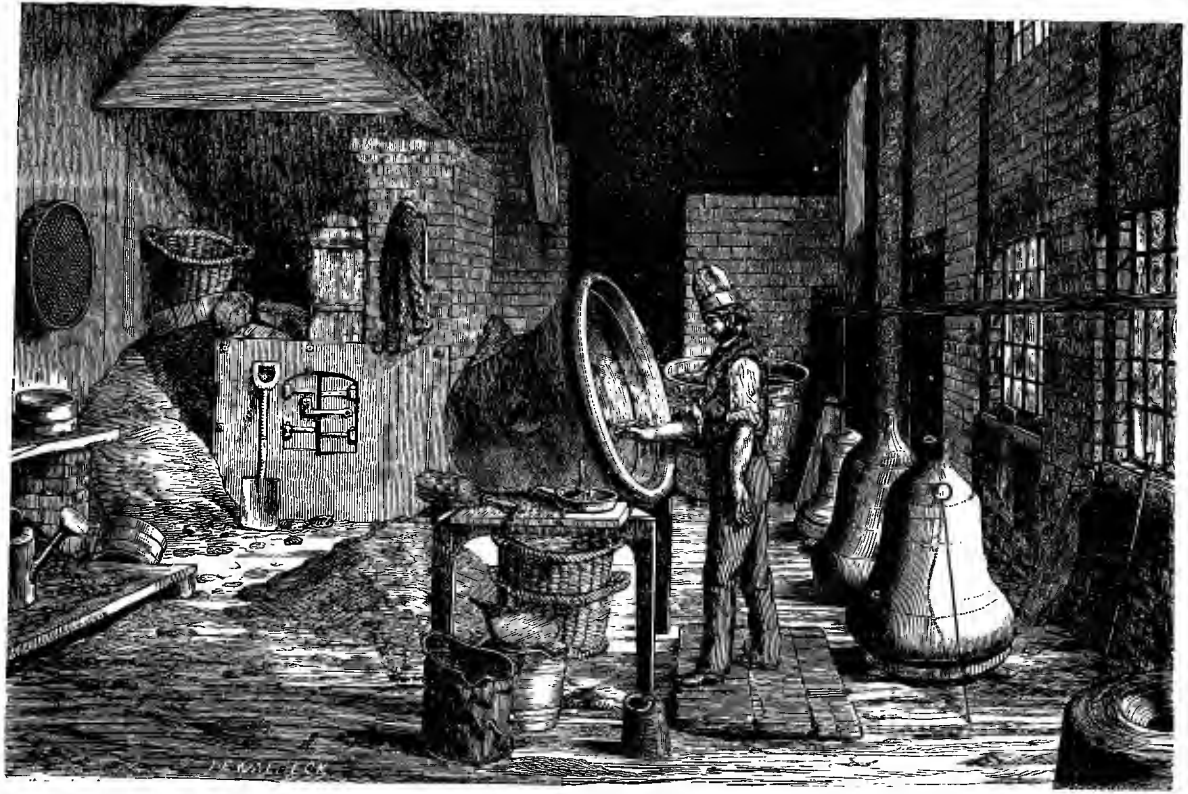


FIG. 3.—FINISHING THE COPE.

FIG. 4.—FINISHING THE CORE—THE CROOK.

The first principle to be observed is the construction of the shape or form of the future bell, so as to ensure that due harmony in all its parts which shall give to it the proper degree of tone and vibration. Various theories have obtained in different countries, and among the several founders of our own country, as to the best proportions for bells; but the following scale has been proposed, and generally followed as coming nearest to perfection: "Taking the thickness of the sound-bow or brim—that is, the part where the clapper strikes —a bell should measure: in diameter at the mouth, fifteen brims; in height to the shoulder, twelve brims; and in width at the shoulders, seven and a half brims, or half the width at the mouth." These proportions, however, are very variable, and depend greatly on the taste, experience, and skill of the founder, an approximation merely being arrived at in these figures.

The size and proportions, then, of the future bell being ascertained, the making of the mould is proceeded with. The *outer* form of the core—by which the *inner* shape of the bell is determined—is made by means of a *crook*, which is made to revolve on the clay, &c., of which the mould is composed. This crook is a kind of double compass, the outer leg of which is in two parts, formed of wood and metal. The inner part, of metal, is cut or curved to the shape of the outside of the core or inside of the intended bell; and the outer part, of wood, to the form the outside of the bell is to be made. A glance at the engraving (Fig. 4) will render this plain to the reader. This crook or compass is made to move on a pivot affixed to a beam above, and its lower end driven into the ground. In the case of very large bells the mould is perfected in the pit in which they are to be cast. The crook is driven by the hand of the moulder; and the mould being composed of plastic clay, &c., the form of the inner side of the bell is defined by a few revolutions of this simple machine. Thus is formed the *core*, or inner mould. The *cope*, or outer mould, is formed in much the same way, except that its inner surface is smoothed to form the outer side of the bell.

The *core* is first roughly built up of brickwork with a hollow in the centre. It is then plastered over with soft clay, &c., and moulded as described by the action of the crook; and is afterwards dried by means of a fire in the hollow mentioned. When baked sufficiently hard, it is covered all over with a size of tan and grease. Over this size a coating of haybands and loam is laid, the exact thickness the

bell is intended to be made; on this thickening the outer leg of the crook is made to rotate, and so forms the shape of the inside of the cope, or outer mould. When the thickening has been sufficiently dried by the action of the fire inside the core, the cope, or outside mould, is formed; when thoroughly dried the outer mould is removed, and the thickening (the *fac-simile* of the bell) destroyed, the space between the core and cope being, of course, the exact shape of the future bell. The inner and outer moulds having been examined, retouched, and otherwise finished off, any device or inscription necessary is moulded and fixed, and the cope fitted over the core (as represented in Fig. 5), like an extinguisher over a candle, with a vacuum left between them to receive the fused metal; the head and staple to hold the clapper are then fitted on, when the mould may be said to be complete. One indispensable precaution is necessary, however, in making the mould—that is, to leave a hole for the escape of the air when the metal is poured in, the failure of which would cause the destruction of the bell in the process of casting. This hole is left in the cap of the mould.

We will suppose all the preliminaries successfully accomplished, and the various moulds ready to receive the melted metal; for, although we have described the working and preparing of only one set of moulds, there are generally some dozens of bells cast on the same day. We step into another large room, and here we witness the actual

OPERATION OF BELL-FOUNDING.

The various moulds having been brought into this part of the factory, they are firmly embedded in the earth, and nothing of them is visible but the holes in their caps. On the occasion of the casting of a peal of large bells, the fused metal is carried at once from the furnace to the pit by means of a series of gutters, and when one bell is completed the fiery wave is stopped off and directed to the mouth of another mould. Our artist has very graphically described this scene (Fig. 6). The bell-metal being tested and found to be of the right temperature, the furnace-doors are opened, and out rushes the liquid fire, bubbling and boiling in a white heat, too fierce to look upon. "Is the bell," says Schiller, in his famous Song of the Bell—

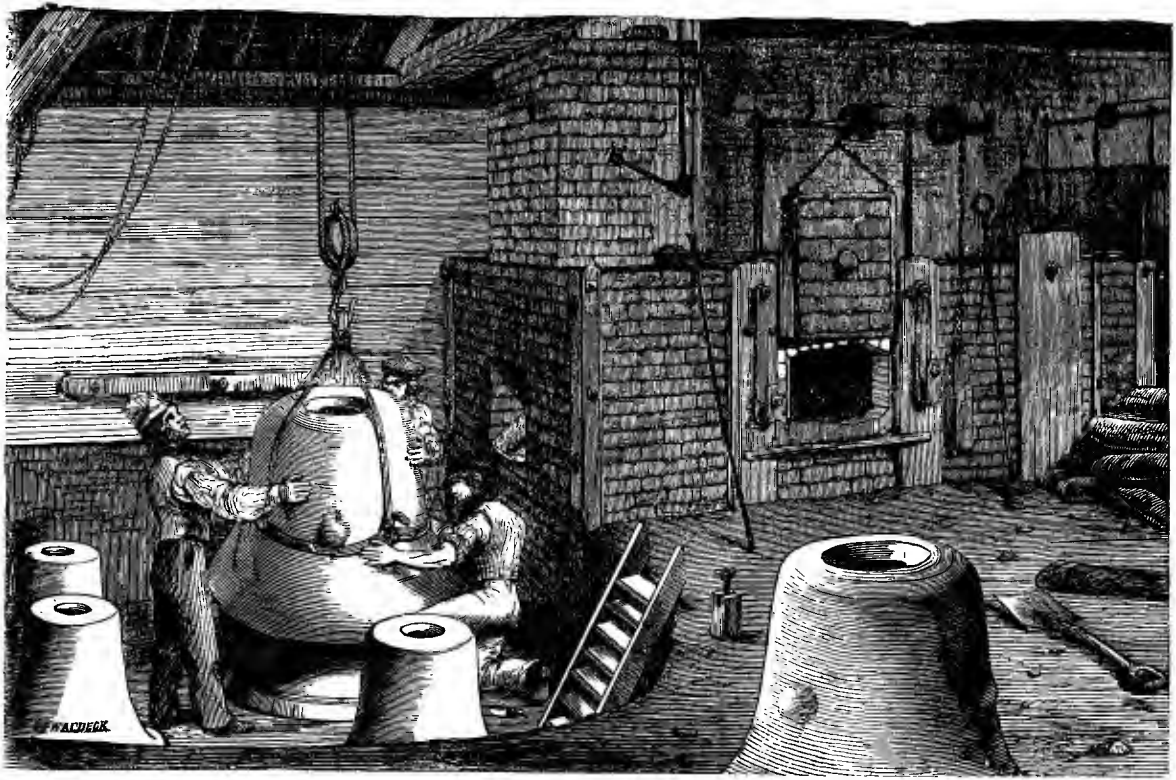


FIG. 5.—PUTTING ON THE COPE.

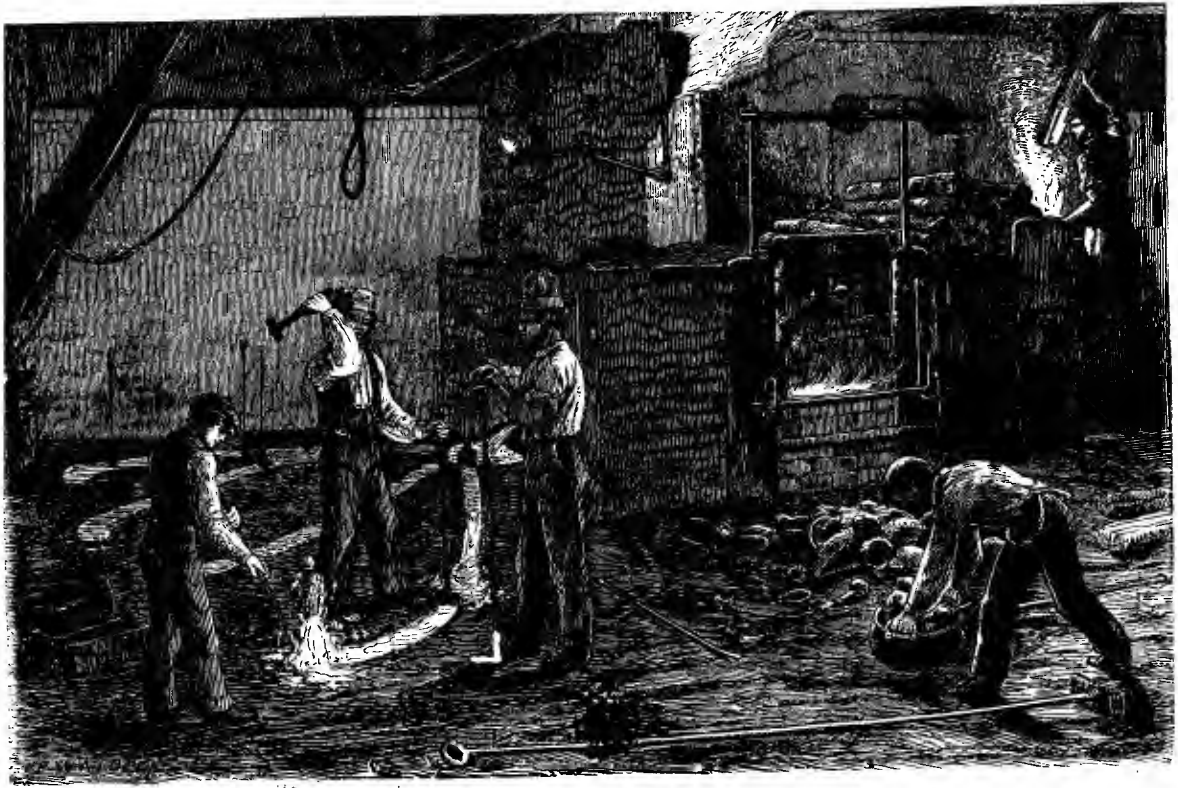


FIG. 6.—CASTING LARGE BELLS.

"Is the bell in the ground well bedded?
Is the mould well set and steadied?
Skill and diligence to pay,
Will it issue fair to-day?
Should the cast not hit,
Should the coping split;
Ah! perhaps while hopes elate us,
Now, e'en now, mishaps await us!"

Mishaps, however, seldom happen at Messrs. Mears and Stainbank's foundry, where everything is conducted on sound and scientific principles. As many as a dozen large and many small bells are cast at one melting, and as much as twenty tons of metal consumed. In the Montreal Foundry, so called from the fact that the great bell mentioned below was cast in it, a pit is especially prepared close to the furnace-door to prevent the waste or cooling of the metal on the occasion of any "great cast;" on ordinary occasions, however, the metal is melted in crucibles (as shown in Fig. 7), and being carried from place to place, is poured into moulds, just as the poet describes the process:—

"In the furnace the dry branches crackle; the crucible shines as with gold
As they carry the hot flaming metal in haste from the fire to the mould;
Loud roar the bellows, and louder the flames as they shrieking escape,
And loud is the song of the workmen who watch o'er the fast-filling shape.
To and fro in the red glaring chamber the proud master anxiously moves,
And the quick and the skilful he praiseth, and the dull and the sluggard reproves
And the heart in his bosom expandeth as the thick bubbling metal upswells,
For like to the birth of his children he watcheth the birth of the bells!"

In our day no song of the bell greets the final accomplishment of the successful day's work; but, what is much better, the workmen are well paid, intelligent, and contented. Some of the workmen in Messrs. Mears and Stainbank's employment have worked in the foundry for more than forty years.

In the casting of small bells, such as hand and house tintinnabulums, precisely the same process as above described takes place, with only such modifications as their size renders necessary. An ordinary sized bell takes about twenty-four hours to cool; but a bell like Big Ben, or that cast for the Montreal church, would not be touchable to the hardest of fingers under about four days. When they are cool they are dug out of their pits, the moulds being destroyed in the process, and they are taken at once to

THE TUNING ROOM.

On the occasion of our visit there was in the tuning room a peal of eight bells, which had just then been cast for a church in Port Phillip, ready tuned, and only waiting to be shipped. Standing

on their crowns, the tuner very dexterously struck out such a "change" as made us almost exclaim with the Frenchman—

"Disturbers of the human race,
Whose chimes are always ringing,
I wish the ropes were round your necks,
And you about them swinging."

But then it must be stated that the sound of such a powerful peal as this is not often heard in a room less than twenty feet square.

The process of tuning a bell is a very simple one. Sometimes a peal of bells is cast in harmony, in which case it is called a maiden peal, and no tuning is required. Such peals, we were assured, are by no means common, and are nearly always imperfect. Separate bells do not require tuning. The action of the wheel and cutters of the machine employed in the process of tuning is very simple, and will be readily understood by any one acquainted with machinery. This instrument is driven by a small steam-engine, which also does a great deal of work in the different parts of the factory, in the way of lifting, carrying, &c. When the tone of the bell is too sharp, it is turned thinner; and if it be too flat, the diameter is lessened in proportion to its substance. But such is the general correctness of the scientific principles in use in this foundry, that very little tuning is requisite. If the quantity of metal in a bell is too small in proportion to its calibre, as is sometimes the case, the power and quality of its tone is altogether lost, and only a *panny*, harsh, iron-like sound is produced from it. In such a case it is invariably re-cast.

There is really very little to be said of the *manufacture* of bells much may, however, be written of their associations. Who has not listened, "delighted, yet sad," to the chimes as they float across the water at night? Who amongst us cannot sympathise with the American poet, when, in full harmonious swell, he breaks out into a strain like this?—

"Hear the mellow wedding bells—
Golden bells!
What a world of happiness their harmony foretells!
Through the balmy air of night,
How they ring out their delight;
From the molten—golden notes
All in tune.
What a liquid ditty floats
To the dove, that listens while she gloats
On the moon!
Oh! from out the sounding cells
What a gush of euphony voluminously wells!
How it swells,
How it dwells

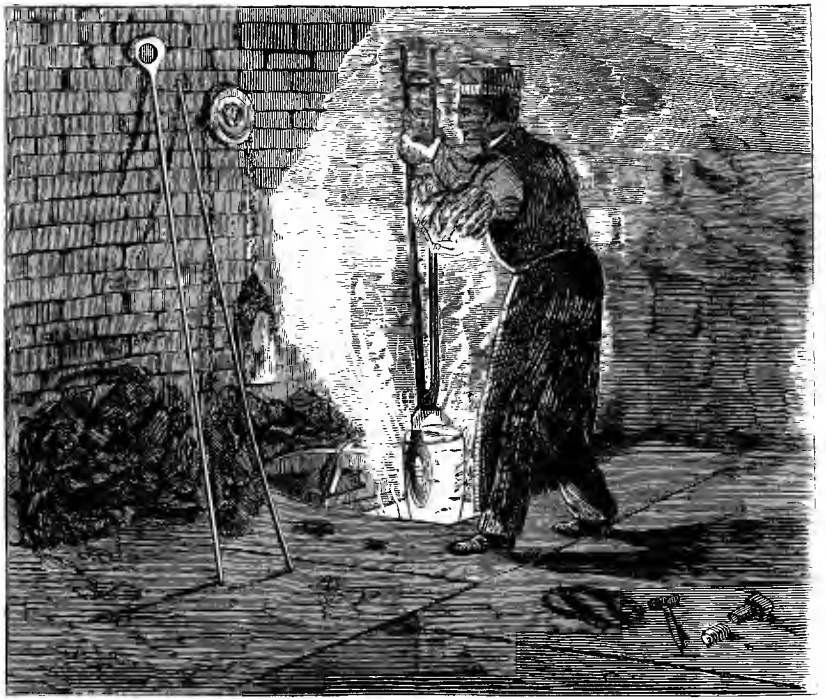


FIG. 7.- DRAWING THE CRUCIBLE.

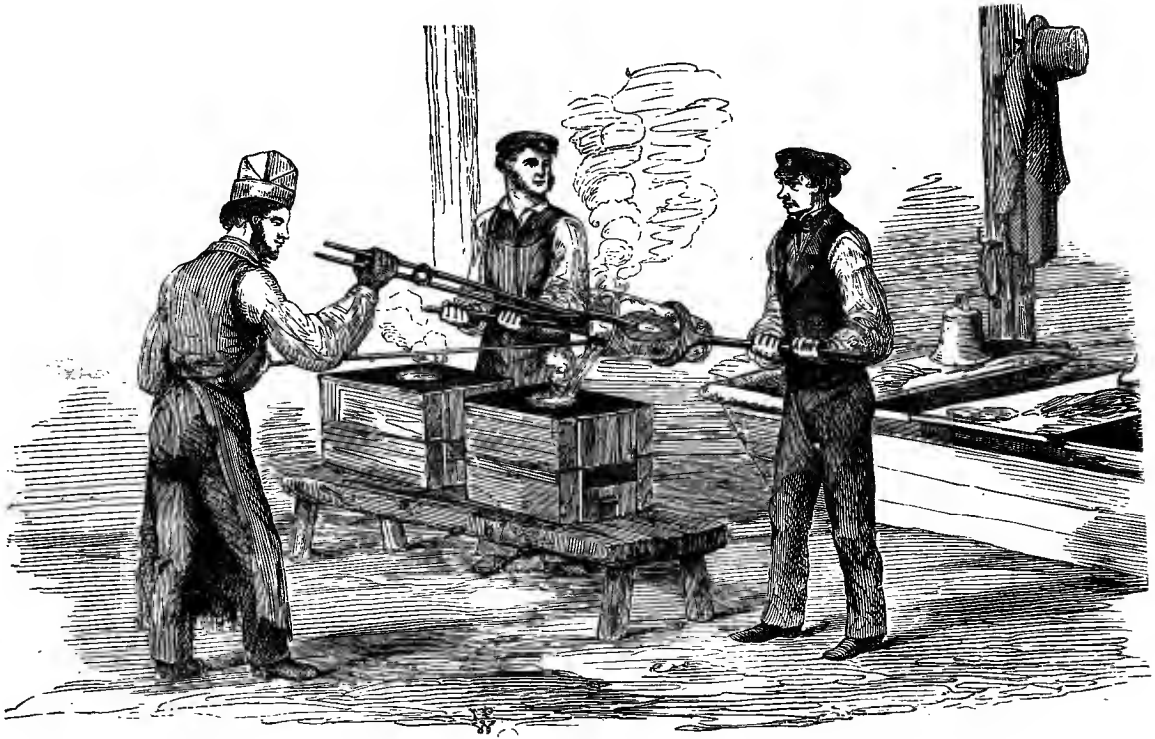


FIG. 8.—CASTING SMALL BELLS.

On the future! How it tells
Of the rapture that impels
To the swinging and the ringing
Of the bells, bells, bells,
Of the bells, bells, bells, bells,
Bells, bells, bells,
To the rhyming and the chiming of the BELLS!"

Our *changes* are almost rung out, but we may yet indulge for a little space to notice the origin of

CHIMES, CARILLONS, AND PEAL-RINGING.

And here again we must acknowledge our obligations to Mr. Gatty's charming little volume. Ours has been called "the ringing island." In other countries, the music of bells is obtained by striking them from the outside, as in Russia; or by means of chimes regulated by pegged barrels moved by clockwork, as in France; or by means of carillon pedals, played with keys like an organ, as in the Netherlands. All these methods of bell-playing have also been adopted occasionally in our own country, but, notwithstanding that chimes have been often fitted to our cathedral bells, the old national plan of ringing by ropes and manual labour is at once the most popular and most musical. "Carillons," says Dr. Burney, "are played with some difficulty, as the keys require to be struck with considerable force before the bells will give forth their true full sound; and in consequence of the player possessing no power to stop the vibrations of each bell, the notes of one passage perpetually run into another, and become so inarticulate and confused as to occasion a very disagreeable jargon,

"'Like sweet bells jangled, out of tuns and harsh.'"

In fact, no plan of ringing bells can be considered so entirely appropriate to their peculiar kind of harmony as the old English plan of peal-ringing and musical changes.

The antiquity of the custom of bell-ringing by means of a rope is undoubted; for in this way the single bells in our old churches were rung; but the date of the introduction of peal-ringing—that system of ringing by peals or numbers, which, while it brings out the true tone of the bells in a succession of musical notes, is managed with mechanical precision—is unknown. The first peal of bells of which we have any reliable account is that peal of five bells which was presented to King's College, Cambridge, by Pope Calixtus III., in 1456. From that period, the placing of several bells in the towers of churches became more common; but it was not till the middle of the sixteenth century that peal-ringing became reduced to an art,

Parnell gives the following account of the probable invention of these changes:—"The earliest artist and promoter of change-ringing of whom we have any account, was Mr. Fabian Stedman, born in the town of Cambridge, 1631. He introduced various peals on five and six bells, and printed them on slips of paper—being by profession a printer. These being distributed about the country, were soon brought to London, but what progress the art had made in the metropolis at this time* does not appear. The society of College Youths,† in the summer of 1657, on a visit to Cambridge, were presented by Mr. Stedman with his peculiar production on five bells, since called Stedman's principle, which was rung for the first time at St. Benet's, Cambridge; and afterwards at a church on College Hill, Doctor's Commons, London, where the society at that time usually practised, and from meeting at which place they obtained that name. It appears from this account that change-ringing must have been earlier than 1657; as, before those curious and cross-change peals were discovered, single changes were universally practised—*i.e.*, only changing two bells at one time; whereas the improved plan of double and treble changes, &c.—namely, every bell to change at one time—appears to have taken place long before 1657, by Mr. Stedman having produced such a complex method of ringing as his principle. In 1668 he published a book entitled 'Campanalogia; or, the Art of Ringing,' which, before 1680, had gone through three editions."

This work is still considered the standard authority on the subject; and if we come to consider for a moment, we shall soon discover what an infinite variety of sounds may be produced by the judicious *changes* which may be rung upon an octave or diatonic peal of eight bells. If we take three bells merely, we shall perceive by the following arrangement that six changes can be rung upon them:—

1	2	3
1	::	2
2	1	3
2	::	1
3	2	1
3	1	2

Four bells can in the same manner be shown to ring four times as

* Thomas Parnell was a poet and writer in the beginning of the eighteenth century. He was the associate of Addison, Steele, Pope, Gay, and Arbuthnot, and contributed several amusing papers to the *Spectator*, *Guardian*, &c.

† This appears to be the most ancient society of ringers. They are said to have been established in the sixteenth century, and a book containing the memorials of that society in the sixteenth and seventeenth centuries, after escaping the ravages of the fire of London, has been unaccountably lost. It is not improbable, however, that several copies exist among the *waste* of the public libraries; and whenever that *waste* comes to be fully examined, we may naturally expect many prizes to turn up.

FIG. 9.—POURING THE METAL IN THE MOULD.

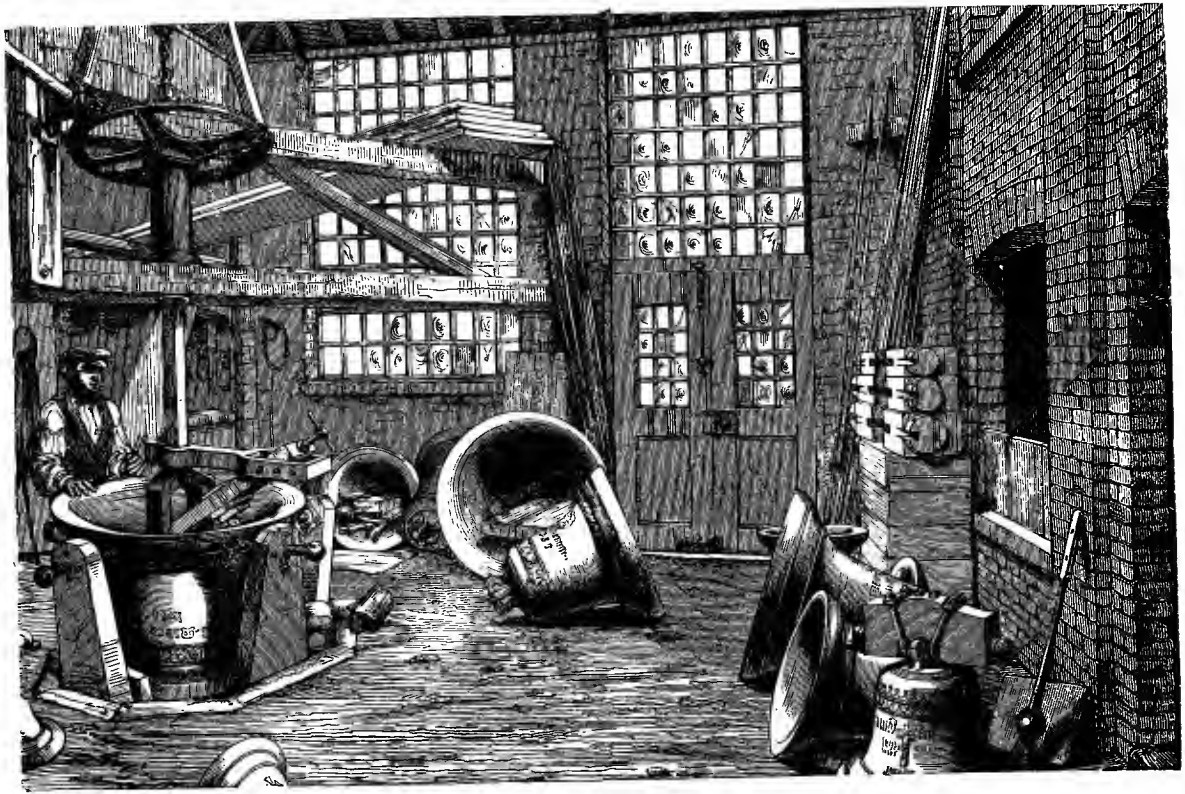


FIG. 10.—THE TUNING ROOM.

many changes as three, viz., twenty-four; five bells, five times as many as four, viz., a hundred and twenty; six bells, six times as many as five, viz., seven hundred and twenty; seven bells, seven times as many as six, viz., five thousand and forty; and so on. And in this way it has been calculated that it would take ninety-one years to ring the changes upon twelve bells, at the rate of two strokes to a second; and to ring the full changes upon a peal of twenty-four bells would occupy, at the above rate, the trifling period of a hundred and seventeen thousand billions of years!

Although peals of ten and twelve bells are often hung, those of five, six, and eight are much more common. We have mentioned that the business of bell-founding has been carried on at Whitechapel for nearly two centuries, and existed in the Mears family for eighty years. Mr. Stainbank is the present proprietor. Since the establishment of the Foundry there have been cast there, besides the great bells mentioned, a set of hour and quarter bells for the Queen, at Osborne House, and another set for the Prince of Wales, at Sandringham, no fewer than—

	CWTS.
10 Peals of 12 bells each, weighing in the aggregate	1,350
28 Peals of 10 bells each	3,900
175 Peals of 8 bells each	10,500
260 Peals of 6 bells each	12,750
80 Peals of 5 bells each	2,400

But, in addition to the above, there have been cast at this establishment up to the present time, including bells of four hundred weight and upwards, with chimes added, no fewer than two hundred thousand single bells—an amount of work of this kind unprecedented, perhaps, by any other founders in the world. In the above enumeration, moreover, no account has been taken of the almost innumerable number of hemispherical and conical bells, clock-spring gongs, musical hand-bells, railway, postman's, dustman's, house, sheep, dinner, and latten bells, constantly in course of manufacture; carillons, and various other descriptions of harmonious combinations of this ancient and beautiful kind of music. Who that possesses, as Cowper has it, a

> "Soul in sympathy with sweet sounds,"

can listen unmoved to

> "The music of the village bells
> Falling at intervals upon the ear
> In cadence sweet,—now dying all away,
> Now pealing loud again, and louder still,
> Clear and sonorous as the gale comes on."

"Bell," goes the old German song, "thou soundest merrily when

the bridal party to the church doth lie; thou soundest solemnly when, on Sabbath morn, the fields deserted lie; thou soundest merrily at evening, when bed-time draweth nigh; thou soundest mournfully, telling of the bitter parting that hath gone by! Say, how canst thou mourn or rejoice that art but metal dull? And yet all our sorrowings and all our rejoicings thou art made to express!" In the words of the motto affixed to many old bells, they "rejoice with the joyful, and grieve with the sorrowful;" or, in the original Latin—

"Gaudemus gaudentibus,
Dolemus dolentibus."

An old monkish couplet, quoted by Henry Spelman, in his glossary, makes the bell describe its uses:—

"Laudo Deum verum, plebem voco, congrego clerum:
Defuncto ploro, pestum fugo, festa decoro."
"I praise the true God, call the people, convene the clergy;
I mourn for the dead, drive away pestilence, and grace festivals."

We will conclude with some account of

A FEW CELEBRATED BELLS.

China has been celebrated for its bells; but the Chinese bells have all the old saucer form. In the sixteenth century four great bells were cast and erected at Nankin, the largest of which weighed, it is said, not less than 50,000 lb., and was twelve feet in diameter at its base. The weight of the bells brought down the tower in which they were hung. At Pekin there were seven bells of enormous dimensions. One of these is described by Magaillans as weighing no less than 120,000 lb., and has a height of 12½ feet, a diameter of 13½ feet, and a circumference of 42 feet. They are used for denoting the five watches of the night; but we learn from the author of "China and the Chinese" that they are now out of repair.

Russia, among the countries of Europe, is the one most celebrated as possessing enormous bells; at Moscow, in particular, there are bells of most enormous size. The largest of them has been described by Dr. Clarke as a mountain of metal, and is termed by the Russians the "Tsar Kolokol," or King of Bells; and from the metal of which it is composed, it is said that thirty-six bells as large as the great one in St. Paul's could be cast. In the tower of St. Ivan's Church, Moscow, says Mr. Gatty, there is a bell weighing 127,836 English pounds. The largest bell in Russia, however, is that described as the King of Bells. It is the largest in the world, and is said to weigh

443,772 lb. The height of this bell is 21 feet 4½ inches; its circumference ten feet above the extremity of the lip is 67 feet 4 inches; its diameter is 22 feet 5⅓ inches, and its greatest thickness 22 inches. It is said to have been given to the Russians by the Empress Anne, and its value in money, merely as old metal, is estimated at £66,565—an immense sum to lie uncirculated and waste, for the bell has never yet struck a note. This monstrous mass of metal was for nearly two centuries allowed to be partially buried in the sand of the pit in which it was moulded—an object of wonder to the traveller and of deepest reverence to the natives, who visited it with pride at their festivals, and were extremely jealous of its being touched or measured by strangers.

The tones of the bells of Russia are said to be very fine. That one already spoken of as being hung in the tower of St. Ivan's Church is said to produce, when sounded, a tremulous effect, which is felt all over the city.

The following are the reported weights of some of the most celebrated bells in the world:—

	TONS.	CWT.	QRS.	LBS.
The great bell at Moscow	198	2	1	0
The bell in the tower of St. Ivan's Church, Moscow	57	1	1	16
Another bell in the same church	17	16	0	0
Another, cast in 1819	80	0	0	0
The great bell at Pekin	53	11	1	20
One at Nankin	22	6	1	20
One at Olmutz	17	18	0	0
One at Vienna, dated 1711	17	14	0	0
One at Paris, placed in the cathedral in 1680, twenty-five feet in circumference	17	0	0	0
One at Erfurt, in Germany, and considered to be of the finest bell metal extant	13	15	0	0
Big Ben, Westminster	13	10	3	0
"Great Peter," at York Minster, which cost £2,000, and was erected in 1845	10	15	0	0
Great Bell of St. Paul's, which originally weighed 3 tons 13 cwt. 3 qrs. 1 lb.	5	2	1	22
"Great Tom," at Oxford	7	11	3	4
"Great Tom," at Lincoln	5	8	0	0
"Dunstan," at Canterbury	3	10	0	0
The great bell at Montreal	12	10	0	0
Another at Montreal	7	6	0	0
A bell at Toledo	17	0	0	0

Big Ben and the latter two large bells were cast by the Messrs. Mears, who also re-cast the "Great Peter" of York, the "Great Tom" of Lincoln, the "Dunstan" at Canterbury, and the peal of bells in the tower of the Royal Exchange. The great bell of St. Paul's was made by their predecessors, Phelps and Bradley, at the Whitechapel Foundry, 1716.

Manufacturers of

CHURCH-CLOCK, HEMISPHERICAL, AND EVERY OTHER DESCRIPTION OF BELLS.

GENERAL BRASS FOUNDERS.

Makers of the Bells at Osborne House;

GREAT BELL OF WESTMINSTER,

Weight 13 *tons* 10 *cwt.* 3 *qrs.* 15 *lbs.*;

GREAT BELL OF MONTREAL,

Weight 11 *tons* 11 *cwt.*;

GREAT PETER OF YORK,

Weight 10 *tons* 15 *cwt.*;

GREAT TOM OF LINCOLN,

Weight 5 *tons* 8 *cwt.*;

SAINT DUNSTAN OF CANTERBURY,

Weight 3 *tons* 10 *cwt.*;

One Peal of 15 Bells; Two Peals of 13 Bells; Eight Peals of 12 Bells; Thirty-seven Peals of 10 Bells; Two Hundred Peals of 8 Bells; Two Hundred and Seventy-nine Peals of 6 Bells; Eighty-five Peals of 5 Bells;

And numerous other Peals of smaller number, as well as single Bells of various sizes.